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Estimation of Cod, Haddock and Yellowtail Flounder Discards from the Canadian Georges Bank Scallop Fishery for 2005

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ABSTRACT

Discards of Atlantic cod, haddock and yellowtail flounder from the 2005 Canadian scallop fishery on Georges Bank were estimated from 11 observed trips. Data were insufficient to determine spatial differences in discard rates but temporal (quarterly) trends were estimated. Discards were estimated by applying the observed quarterly discard rate to the total quarterly effort of the scallop fleet. Discard rates were highest for yellowtail flounder and cod while those for haddock were substantially lower.

RÉSUMÉ

On a estimé les rejets de morue, d'aiglefin et de limande à queue jaune dans la pêche canadienne du pétoncle en 2005 d'après les données recueillies par des observateurs durant 11 sorties de pêche. Ces données se sont avérées insuffisantes pour déceler des différences spatiales dans les taux de rejet, mais on a pu, cependant, établir des tendances temporelles (trimestrielles). Pour estimer les rejets, on a appliqué le taux de rejet trimestriel observé à l'effort trimestriel total de la flottille de pétoncliers. Les taux de rejet les plus élevés concernaient la limande à queue jaune et la morue, tandis que ceux qui portaient sur l'aiglefin étaient considérablement plus faibles.

Introduction

Management measures established in 1996 prohibited the landing of groundfish (except monkfish) by the Canadian scallop fishery on Georges Bank. All incidental catch of cod, haddock and yellowtail flounder in 2005 was therefore discarded. Discards, pre or post 1996, were not recorded in the scallop fishery statistics. Discards of Atlantic cod, haddock and yellowtail flounder from the Canadian scallop fishery for 1960-2004 were estimated by Van Eeckhaute et al (2005). The current analysis updates the Canadian scallop fishery discard estimate series for 2005.

Data and Methods

Any incidental catch that is not landed, i.e., is not recorded in the fishery statistics records, is designated as "discards". Discards of incidentally caught species in the scallop fishery on Georges Bank were estimated by applying the discard rate in kg/hour obtained from observed trips to the total scallop effort hours.

$$discards = total\ scallop\ effort \times (observed\ discards / observed\ scallop\ effort)$$

This approach is dependent on the assumption that the population density of the incidentally caught species experienced by observed trips, i.e. the (*observed discards / observed scallop effort*) ratio, is representative for the whole scallop fishery. Therefore, results can be sensitive to inadequate sampling of the spatial/temporal variation in the population density of the incidentally caught species.

Estimates of Atlantic cod, haddock and yellowtail flounder discards from the 2005 Canadian scallop fishery on Georges Bank were derived from 11 observed trips (Table 1). The spatial coverage of observed trips in relation to the fishery is illustrated by quarter in Figure 1. Although effort by the scallop fleet occurred during quarters 2 and 4 on the southern part of Georges Bank (unit area 5Zm), an area where densities of yellowtail flounder have been higher in the past, there was no observer coverage.

Results

Effort refers to hours towed, with usually 2 dredges being towed at the same time. As there is no adjustment for the number of dredges or size of dredges, it is assumed that the amount of gear used on observed trips is representative of the amount of gear used in typical operations. Effort information for observed trips may be obtained from observer records or from fishery statistics. Since the fleet effort must be obtained from fishery statistics, effort from fishery statistics was also used for the observed trips to ensure consistency. Trip effort for the 2005 observed trips was obtained from fishery statistics (pers. com. Dr. Ginette Robert, DFO), except one case where the observed number of dredges fished was pro-rated to effort using a proportional relationship because effort was not recorded in the fishery statistics.

The fishery statistics effort represents the hours fished for an entire observed trip. The observed discards are only for the portion of the fishing activity that was observed. It is necessary therefore to prorate the observed discards to the discards for the entire observed trip. For 2005, effort hours were not recorded but the number of dredge hauls that were observed and the total number of dredge hauls that were made on the trip were recorded. The total discards for a trip was obtained by prorating the observed discards by the ratio of total number of dredges to observed number of dredges recorded for the trip.

Both temporal and spatial patterns in discard rates might be expected, but there were not enough observed trips in 2005 to calculate discard rates for each quarter and area, as 5Zm had limited observer coverage. The discard rates from observed trips in 2005 were aggregated to obtain seasonal factors (Figure 2). The pro-ration was conducted using discard rate by quarters (Table 1). To estimate discards, the quarterly discard rates were applied to the total quarterly effort of the scallop fleet (Table 2). Discard rates were highest for yellowtail flounder and cod while those for haddock were substantially lower.

References

Van Eeckhaute, L., S. Gavaris and H. H. Stone 2005. Estimation of cod, haddock and yellowtail flounder discards from the Canadian Georges Bank scallop fishery for 1960 to 2004. TRAC Reference Document 2005/02.

Table 1. Observed trips for the Canadian Georges Bank scallop fishery in 2005.

					Trip Discard (mt)									
		Dredges			Yellowtail Flounder		Cod		Haddock			Discard Rate (kg/hour)		
Trip ID	Date Landed	Obs.	Total	Proration	Observed	Pro-rated	Observed	Pro-rated	Observed	Pro-rated	effort (hrs)	Yellowtail Flounder	Cod	Haddock
T2005-1	1/16/2005	134	226	0.59	0.311[1]	0.525	0.302	0.509	0.223	0.376	67	7.829	7.602	5.613
T2005-2	3/9/2005	359	679	0.53	0.359[1]	0.679	0.355	0.671	0.092	0.174	169	4.018	3.973	1.030
T2005-3	3/28/2005	536	776	0.69	0.703	1.018	0.172	0.249	0.307	0.444	203[2]	5.014	1.227	2.189
	2005 Q1					**1.018**		**1.430**		**0.995**	**439**	**5.014**	**3.257**	**2.266**
T2005-4	5/23/2005	238	466	0.51	1.125	2.203	0.387	0.758	0.06	0.117	157	14.030	4.826	0.748
	2005 Q2					**2.203**		**0.758**		**0.117**	**157**	**14.030**	**4.826**	**0.748**
T2005-5	7/13/2005	1156	1511	0.77	9.273	12.121	0.72	0.941	0.738	0.965	340	35.649	2.768	2.837
T2005-6	7/14/2005	414	520	0.80	1.053	1.323	0.279	0.350	0.349	0.438	121	10.931	2.896	3.623
T2005-7	8/11/2005	434	842	0.52	0.199	0.386	0.307	0.596	0.106	0.206	228	1.693	2.612	0.902
T2005-8	9/29/2005	376	488	0.77	0.549	0.713	0.049	0.064	0.109	0.141	166	4.292	0.383	0.852
	2005 Q3					**14.542**		**1.951**		**1.750**	**855**	**17.008**	**2.282**	**2.047**
T2005-9	10/24/2005	172	347	0.50	0.075	0.151	0.232	0.468	0.16	0.323	65	2.328	7.201	4.966
T2005-10	11/24/2005			0.59[3]	0.07	0.119	0.296	0.504	0.138	0.235	224	0.532	2.251	1.049
T2005-11	12/16/2005	320	620	0.52	0.272	0.527	0.369	0.715	0.106	0.205	146	3.610	4.897	1.407
	2005 Q4					**0.798**		**1.687**		**0.763**	**435**	**1.833**	**3.878**	**1.754**

[1] Not used because of species identification error.
[2] Effort derived from average hours per dredge.
[3] Proration factor based on ratio of observed to total scallop catch.

Table 2. Discards from the Canadian scallop fishery on Georges Bank for 2005.

		Yellowtail Flounder			Cod			Haddock		
Quarter	Effort (hr)	Discard Rate (kg/hr)	Quarterly Discards (mt)	Annual Discards (mt)	Discard Rate (kg/hr)	Quarterly Discards (mt)	Annual Discards (mt)	Discard Rate (kg/hr)	Quarterly Discards (mt)	Annual Discards (mt)
Q1	4826	5.014	24		3.257	16		2.266	11	
Q2	7690	14.030	108		4.826	37		0.748	6	
Q3	9916	17.008	169		2.282	23		2.047	20	
Q4	8838	1.833	16	317	3.878	34	110	1.754	16	52

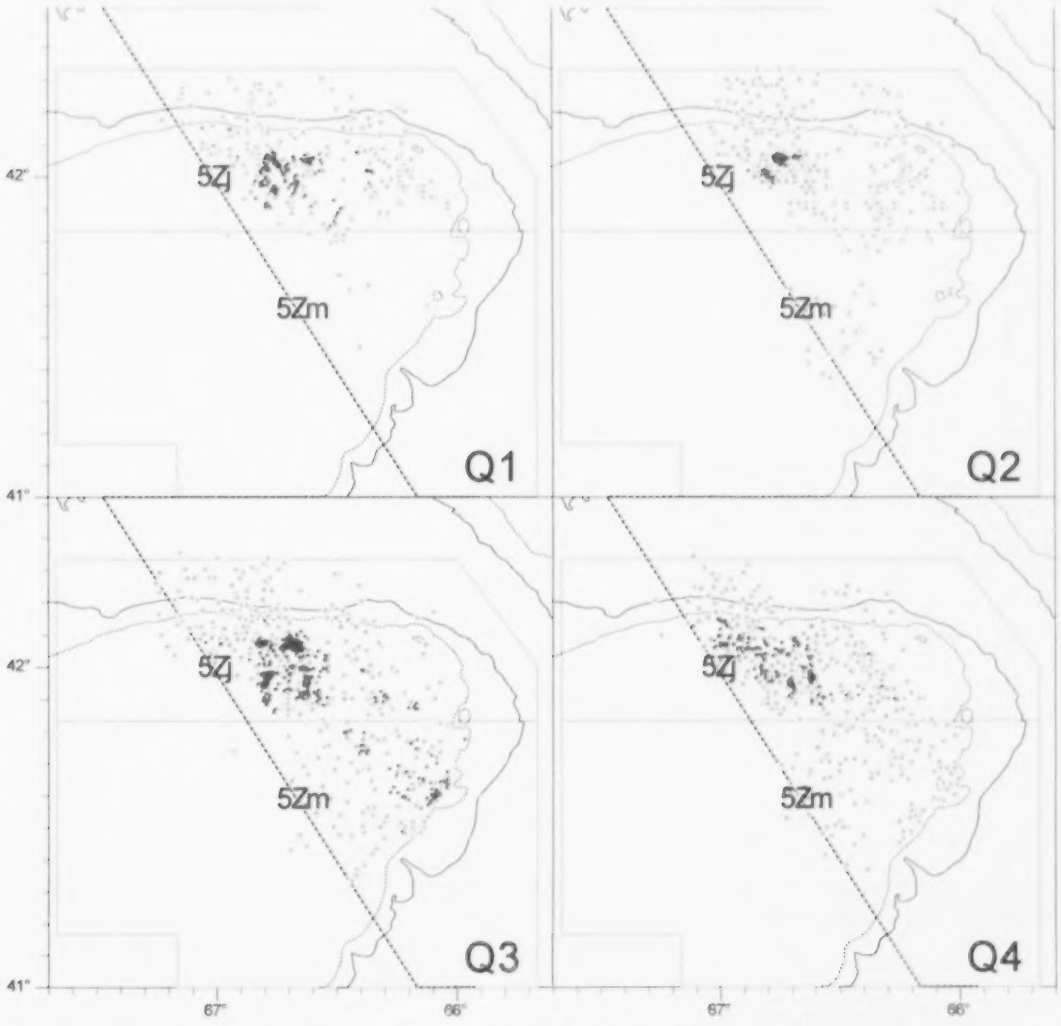

Figure 1. Location of fishing activity of the Canadian scallop fleet (light/grey circles) and observed trips (dark/blue squares) in 2005. The fishing locations for the fleet represent the first dredge haul of the day while the observed fishing locations represent the first dredge haul of a set consisting of several dredge hauls. The fishing activity locations for the fleet may contain errors, for example, the locations on the west side of the Canada/USA boundary are most likely due to errors in recording.

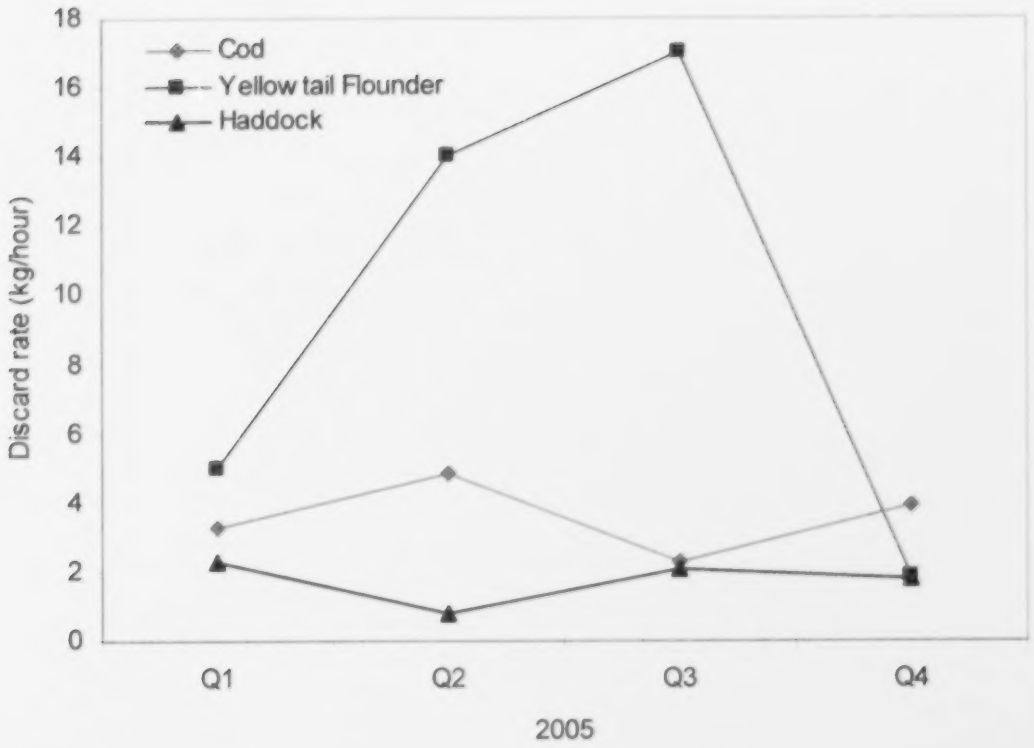

Figure 2. Quarter discard rates of yellowtail flounder, Atlantic cod and haddock from the Canadian scallop fishery on Georges Bank in 2005.